CLAIMS

What is claimed is:

1. A system comprising:

a compressor;

a motor attached to said compressor for powering said compressor;

a motor protector associated with said motor;

logic circuitry associated with said motor protector; and

an intelligent device in communication with said logic circuitry, said intelligent device operable to indicate an operating condition of the cooling system.

2. The system according to Claim 1, wherein said logic circuitry determines an operating time for said compressor and an idle time for said compressor.

3. The system according to Claim 1, wherein said logic circuitry determines a length of time said motor is outside of specified operating parameters.

4. The system according to Claim 1, further comprising an electrical plug, said logic circuitry being integrated into said electrical plug.

5. The system according to Claim 1, further comprising a contactor, said logic circuitry being integrated into said contactor.

6. The system according to Claim 1, wherein said intelligent device receives diagnostic information from said logic circuitry.

7. The system according to Claim 1 further comprising:

a sensor in communication with said logic circuitry and operable to monitor an operating characteristic of the cooling system wherein said logic circuitry receives said operating characteristic from said sensor and is operable to shut down said compressor based on said operating characteristic.

8. The system according to Claim 7, wherein said sensor is a pressure sensor operable to monitor a discharge pressure of said compressor.

9. The system according to Claim 7, wherein said sensor is a temperature sensor operable to monitor ambient temperature.

10. The system according to Claim 7, wherein said sensor is a voltage sensor operable to monitor electrical voltage being supplied to said motor.

11. The system according to Claim 7, further comprising a demand signal, said demand signal in conjunction with said sensor being used by said logic circuitry to monitor said operating characteristic.

12. The system according to Claim 7, wherein said sensor is a current sensor operable to monitor electrical current supplied to said motor.

13. The system according to Claim 12, wherein said logic circuitry determines said status of said motor protector based on input from said current sensor.

14. The system according to Claim 13, further comprising a demand signal, said demand signal in conjunction with said status of said motor protector being operable to monitor said operating characteristic of the cooling system.

15. A system comprising:

a compressor;

a motor protector associated with said compressor;

logic circuitry signal operable to analyze a condition of the motor protector; and

an intelligent device in communication with said logic circuitry and operable to indicate said condition.

16. The system according to Claim 15, wherein said logic circuitry analyzes said condition and said intelligent device indicates a specific fault cause.

17. The system according to Claim 15, wherein said logic circuitry determines the trip frequency of the motor protector.

18. The system according to Claim 15, wherein said logic circuitry determines the average ON time of the compressor.

19. The system according to Claim 15, wherein said intelligent device is operable to visually communicate said specific fault cause.

20. The system according to Claim 15 wherein said logic circuitry is operable to output to said intelligent device a coded sequence of electrical pulses to identify said specific fault cause.

21. The system according to Claim 15 further comprising a demand signal sensor associated with said logic circuitry.

22. The system according to Claim 21, wherein said demand signal sensor monitors a supply voltage.

23. The system according to Claim 21, wherein said demand signal sensor is in communication with a system controller supplying a signal indicating demand.

24. The system according to Claim 21 further comprising a current sensor associated with said logic circuitry.

25. The system according to Claim 24 wherein said logic circuitry receives an output of said current sensor, an output of said demand sensor and derives a motor protector trip frequency from said received current and demand signal.

26. The system according to Claim 24, wherein said current sensor includes a main winding current sensor and an auxiliary winding current sensor, said logic circuitry communicating said condition based on input received from said demand signal sensor, main winding current sensor and auxiliary winding current sensor.

27. The system according to Claim 26, wherein said logic circuitry is operable in a normal run condition, said logic circuitry moving the protector to a tripped condition in the absence of a signal from both said main winding current sensor and said auxiliary winding current sensor.

28. The system according to Claim 26, wherein said logic circuitry is operable in a protector trip condition, said logic circuitry outputting a normal run condition signal when receiving output from at least one of said main winding current sensor and said auxiliary winding current sensor and output from said demand sensor is acceptable.

29. The system according to Claim 26, wherein said logic circuitry derives a motor protector trip frequency from said input received from said demand signal sensor and at least one of said main and auxiliary winding current sensors.

30. The system according to Claim 26, wherein said intelligent device is operable to indicate a fault based on input received by said logic circuitry from at least one of said demand signal sensor, main winding current sensor, and auxiliary winding current sensor.

31. The system according to Claim 30, wherein said intelligent device is operable to indicate a specific fault cause.

32. A method comprising:

analyzing an operating condition of a motor protector associated with a compressor;

identifying a compressor fault cause based on said analyzing; and

communicating said fault cause to an intelligent device.

33. The method according to Claim 32, wherein said operating condition includes a trip frequency of the motor protector.

34. The method according to Claim 32, further comprising determining an average ON time of the compressor.

35. The method according to Claim 32, further comprising sensing a demand signal and a current and deriving a motor protector trip frequency from said sensed current and demand signal.

36. The method according to Claim 35, wherein said identifying a compressor fault cause includes indicating a specific fault cause based on said sensed current and demand signal.

37. The method according to Claim 32, wherein said communicating includes outputting a coded sequence of electrical pulses to identify a specific fault cause.